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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,710	01/09/2002	Joachim Hagenauer	2345/41A	7448

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EXAMINER

BURD, KEVIN MICHAEL

ART UNIT

PAPER NUMBER

2631

DATE MAILED: 01/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/043,710

Applicant(s)

HAGENAUER ET AL.

Examiner

Kevin M Burd

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

1. This office action, in response to the amendment filed 10/20/2003, is a final office action.

### ***Response to Arguments***

2. Applicant's arguments filed 10/20/2003 have been fully considered but they are not persuasive.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the reference

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Hagenauer (Sept 1996) specifically cites the Hagenauer (March 1996) reference as support in the introduction paragraph and cites it in the References on page 569.

The following rejections of the claims address the newly added limitations.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 25-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 25-27, numerous variables are introduced in these claims and are not defined in the claims. It is unclear what variables "C",  $x_i$ , " $y_i$ ", " $U_i$ ", " $x$ ", " $y$ ", etc represent. All variables must be defined in the claims.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hagenauer, "Forward Error Correcting for CDMA Systems", Proceedings of ISSSTA '95

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International Symposium on Spread Spectrum Techniques and Applications, Mainz, Germany, Vol. 2, September 1996, pp 566-569 in view of the instant application's disclosed prior art, and further in view of Hagenauer et al, "Iterative Decoding of Binary Block and Convolutional Codes," IEEE Transactions of Information Theory, Vol 42, No. 2, March 1996, pp 429-445.

Regarding claims 1, 4-6, 17 and 20-22, Hagenauer (Sept 1996) discloses a method of decoding a received signal by providing a soft-in/soft-out decoder in a receiver where the soft-in/soft-out decoder comprises an inner and outer decoder (pp 566-567). Figure 3 on page 567 shows the inner decoder outputting a signal to the input of the outer decoder. This signal comprises L values as stated in the right hand column of page 567 and the L values are soft values. The soft values will be processed as reliability information, as L values at an output of the inner decoder and the input of the outer decoder.

Hagenauer (Sept, 1996) does not explicitly disclose which types of codes are used to decode the received signal even though it is mentioned that Hadamard codes are used. However, on page 1 of the instant application, Applicants acknowledge "Transmission systems having an inner code, namely orthogonal modulation using Walsh functions or rows of Hadamard matrix as code words, and an outer code, for example a convolution code with interleavers interleave factors are known in decoding methods. It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate well known methods of encoding, which allow the transmission

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of signals to decoders, into decoder systems so decoding of well known systems can be conducted as well as newer encoding systems.

Additionally, Hagenauer (March, 1996), titled "Iterative Decoding of Binary Block and Convolution Codes" more clearly shows in figure 4 on page 433, the decoder system explained previously. This reference was cited in Hagenauer (Sept, 1996) and is a critical element in developing the information shown in the Hagenauer (Sept. 1996) reference. This citation appears on page 569. Hagenauer (March, 1996) discloses in heading III. Optimal and Suboptimal Algorithms, a maximum a posteriori decoder (MAP) is used in which soft information pertaining to the outer code bits are fed back to the first decoder as shown in figure 4 on page 433.

Regarding claims 2, 3, 18 and 19, any type of modulation in the Hadamard matrix can be used. A 32-step or 64-step modulation is advantageous since more data is contained in these matrices than in a 16-step modulation.

Regarding claims 7-12, 14-16 and 23, Hagenauer (Sept. 1996) discloses the use of a priori or posteriori information can be used in the inner or outer decoder (pp 567) and the outer decoder feeds back L values to the inner decoder as shown on figure 3 and figure 4 of Hagenauer (March 1996).

Regarding claims 24, Hagenauer (Sept. 1996) discloses the use of a RAKE receiver in the soft-in/soft-out decoder (pp 567).

***Allowable Subject Matter***

5. Claims 25-27 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: None of the disclosed prior art discloses the specific equations used in the MAP decoder as stated in claims 25-27.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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**Contact Information**

**Any response to this final action should be mailed to:**

**Box AF**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 872-9314, (for formal communications; please mark "EXPEDITED PROCEDURE" or for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Burd, whose telephone number is (703) 308-7034. The Examiner can normally be reached on Monday-Thursday from 9:00 AM - 6:00 PM.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3800.



Kevin M. Burd  
PATENT EXAMINER  
1/3/04



TEMESGHEN GHEBRETINSAE  
PRIMARY EXAMINER